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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/964,336

09/28/2001

Wataru Ito

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06/28/2006

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.  
1800 DIAGONAL ROAD  
SUITE 370  
ALEXANDRIA, VA 22314

EXAMINER

BHATNAGAR, ANAND P

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/964,336

Applicant(s)

ITO ET AL.

Examiner

Anand Bhatnagar

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 15-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/28/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Response to Arguments***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/18/06 has been entered.
2. Applicant has previously canceled claims 1-14. Claims 15, 18, 21, and 23-26 have been amended. Currently claims 15-26 are pending. Applicant has amended the dependency of claim 23, therefore the objection to this claim is withdrawn.
3. Applicant's arguments, see remarks pages 6-12, filed 05/18/06, with respect to the rejection(s) of claim(s) 15-26 under USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Anderson (U.S. patent 4,437,161). Examiner refers to the rejection below.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18-20 and 24-26, as now amended, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims as claimed are indefinite. Regarding claims 18 and 24, the preambles of these claims, as well as the body of the claims, have a single image but the body of the claim refers to performing a process of frame subtraction and in order to perform frame subtraction there needs to be at least two images to perform this process. Further, applicant looks at predetermined regions of "the image", i.e. a single image, "wherein each of these regions has a frame time interval which is changed from the frame time intervals of each of the other predetermined regions". How is this possible with a single image? If the predetermined regions of the image are being compared to the other predetermined regions, which are from the same image since these regions are obtained from one image, then how can they have different frame time intervals if they are from a single image? Examiner will address these claim as best understood.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 15-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Anderson (U.S. patent 4,437,161).

Regarding claims 15 and 21: Anderson discloses an object detecting method for detecting an object in an image obtained from an image pickup means (abstract, col. 1 lines 13-20, col. 3 lines 30-35 and 61-67, and col. 10 lines 1-3, wherein an object(s) in the image(s), which are obtained from a TV camera, is/are detected. The objects that are detected in the images are the contrast medium, organs of interest (such as the heart), blood vessels, etc.) comprising:

a frame subtraction step of executing frame subtraction processing between an input image from the image pickup means and respective ones of a plurality of images each having a different time interval with respect to the time interval of said input image (fig. 2 elements I1, I2, 30, and A, fig. 7 element F, col. 2 lines 18-32, col. 4 lines 13-57, col. 7 lines 3-27. A TV signal, F, in fig. 7 gets converted and used as both signals I1 and I2. This TV signal can be previously recorded or be live images. The first step that takes place is setting up a reference image which is based on patient motion. The first image is usually used as a reference image, which is read as the input image, to be compared to all the other images in the TV signal, unless it is determined that the patient moved then another image is set as the reference image which is after the patient stops moving, but only one image is used as a reference image. Once the

image is set as a reference image for signal I1 then the other TV camera images following the reference image make up the signal I2. Then each of the images from I2 are then subtracted from I1 signal, the set reference image (input image), in order to obtain a set of difference images, i.e. the process is read as "frame subtraction." Each of the images of I2 which are following the reference image have a different time interval with respect to the reference image because images are continuous images, i.e. over time. Further depending on what image is set as the reference image, based on patient motion, then the reference image (input image) will may have a certain time interval because the imaging would have started at a specific time but the reference image is only set based on patient motion. If it is judged that there is no motion then the first image will be set as the reference image and the time, for example the time maybe zero or 1second (it is arbitrary) but if there is patient motion then a reference image will be set after the patient stops moving and in this case the this reference image will have a time interval because it is sometime after the imaging process starts. If the latter is the case then the each of the other images will have a different time interval with respect to the time interval of the set reference image.);

a synthesizing step of adding together differential data obtained by said frame subtraction processing based on coefficients which are set for respective ones of predetermined regions of the image (fig. 10 elements I1, I2, 30, 60, and A and col. 9 lines 1-29, wherein the differential data/images are combined/synthesized by the integrator (element 60). The reference image is

composed of pixels and each pixel of the reference image/other images are read as a predetermined region. Further, each pixel has a respective coefficient/intensity value which are considered to be set since the reference image is set as the I1 signal. Therefore, the process of reference image being subtracted from the other images is read as "the frame subtraction processing based on coefficients which are set for respective ones of predetermined regions in an image"; and

an object detecting step of detecting an object based on data obtained from said synthesizing step (see above argument and col. 3 lines 50-65, wherein a organ of interest/contrast medium are detected) .

Regarding claims 16 and 22: An object detecting method wherein said coefficients are set based on a distance from the image pickup means (see above argument in claim 15 about reference image coefficients, col. 4 lines 51-67, col. 5 lines 60-67, col. 6 lines 1-11, and col. 7 lines 1-28, wherein the reference image and it's coefficients are set based on patient motion/position. The motion of the patient and the position of the patient will affect the values of the images taken. If a patient moves/rotates toward or away from the imaging elements then the distance to the device and/or imaging detectors changes and the coefficients will change also. Therefore when the patient stops moving/rotating and a reference image is set the coefficients will depend on the patients still position and it may be closer or further away from the imaging elements).

Regarding claims 17 and 23: An object detecting method according to claim 15, wherein said coefficients are set based on a magnitude of movement of an object in a respective one of predetermined regions of said image (see above argument in claim 15 about reference image coefficients and the predetermined regions, col. 4 lines 51-67, col. 5 lines 60-67, col. 6 lines 1-11, and col. 7 lines 1-28, wherein the reference image and its coefficients are set based on patient motion/position. The motion of the patient and the position of the patient will affect the values of the images taken. If a patient moves/rotates toward or away from the imaging elements then the distance to the device and/or imaging detectors changes and the coefficients will change also. Therefore when the patient stops moving/rotating and a reference image is set the coefficients will depend on the patient's still position and it may be closer or further away from the imaging elements).

Regarding claims 18 and 24: An object detecting method for detecting an object in an image obtained from an image pickup means, comprising:

a frame subtraction step of executing frame subtraction processing for each of a plurality of predetermined regions of the image obtained from the image pickup means, wherein each of the predetermined regions has a frame time interval which is changed from the frame time intervals of each of the other predetermined regions; and

an object detecting step of detecting an object based on differential data obtained from said frame subtraction processing. See claim 15 above.



Regarding claims 19 and 25: An object detecting method according to wherein said frame time interval is set based on a distance from said image pickup means. See claim 16.

Regarding claims 20 and 26: An object detecting method according to claim 18, wherein said frame time interval is set based on a magnitude of movement of an object in respective one of predetermined regions of said image. See claim 17.

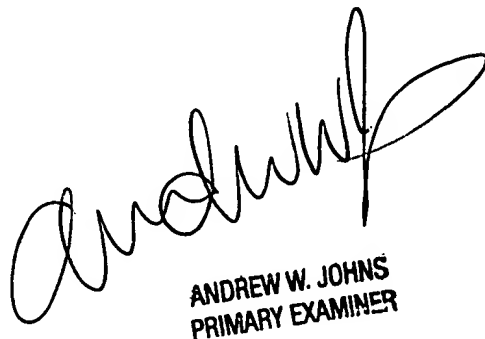
### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sato et al. (U.S. patent 5,574,762) for detecting and counting objects in images.

### **Contact Information**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anand Bhatnagar whose telephone number is (571) 272-7416, whose supervisor is Jingge Wu whose number is (571) 272-7429, Central fax is 571-273-8300, and Tech center 2600 customer service office number is 703-306-0377.



ANDREW W. JOHNS  
PRIMARY EXAMINER

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Anand Bhatnagar

Technology Division 2624

June 25, 2006